Field identification guide to marine benthic invertebrates in West Greenland

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Summary
A Picture guide to the marine benthic invertebrates in West Greenland has been produced based on bycatches from the annual bottom trawl surveys. Analysis of preliminary identifications of invertebrates made onboard the research vessel during 2010-2013 showed common misidentifications. This knowledge has been incorporated in the short text accompanying the description for the taxonomic groups. The guide uses pictures and morphospecies to help identify animals to the right taxonomic group.

Introduction
A picture guide is a valuable aid when working with benthic invertebrates, as they can be difficult to identify without proper visual help. Not only is it often difficult to find pictures of organisms from West Greenland but vastly different taxa can have an outward resemblance to each other. Detailed taxonomic work only exists for a few taxa and they are often very difficult to use for the non-expert. Identifying the organisms caught as bycatch is the first step in identifying areas of high biodiversity and possibly Vulnerable Marine Ecosystems. Bycatch of benthic invertebrates in the trawl fisheries is a source of concern for scientists, managers and conservationists alike. As part of the ongoing commitment to document invertebrate diversity, Pinngortitaleriffik, the Greenlandic Institute of Natural Resources, collects bycatch from the annual bottom-trawl surveys. Collection of corals started in 2010 and this picture guide is intended as a tool helping in the first identification of bycatch brought on deck but also as a guide for fishers, Fisheries observers, Fisheries controllers and other interested parties.

Materials and Methods
During the annual trawl-survey all bycatch were sorted, pictures taken and preliminary taxonomic status were assigned to the specimens. The initial sorting was done on board the research vessel by biology assistants. Their main jobs were to handle shrimp and fish and they are not specifically trained to identify benthic invertebrates. In 2010, the first year of collecting bycatch, only corals were collected. The identification tool available for all years was the NAFO Coral Identification Guide NAFO Area (Kenchington *et al.*, 2009). Material from 2010 – 2013 was the basis for this work as the catches showed the variety of animals caught. An analysis of identifications done by the biology assistants compared to the specimens (frozen or pictures) was undertaken. Based on the analysis common misidentifications were identified and incorporated in the guide. Each taxa presented in the guide has a general anatomical description and representative images of typical species are provided. It has been a priority to show pictures of freshly caught specimens brought on deck, as dried specimens or museum specimens will look different.

Results and Discussion
When the initial sorting onboard the research vessel was analyzed it showed a marked bias towards identifying organisms as corals. Feather stars (Crinoidea), was identified as corals 100% of times from 2010 – 2013 while various morphospecies of bryozoans and hydroids were also identified as corals. In 2010 when the sole focus was to collect corals only 8% of the collected animals were actually corals, the remainders were other organisms bearing an outward resemblance to corals.

The use of the illustrated coral guide from NAFO has led to organisms being interpreted as corals if they resembled the pictures in the guide. The lack of proper identification material such as multi taxa pictorial guides, has led to guessing and "unknown calcified organism" being interpreted as stone corals. This bias is probably directly related to the fact that the new scheme of collecting bycatch was (at first) seen as collecting corals. The difficulties of identifying marine benthic organisms without being an expert are evident. While the marked bias towards identifying organisms as corals is more of psychological interest than a biological problem it shows the underlying problem of identifying organisms as what is presently "in vogue". A visual and easy to use multitaxa guide can solve some of this problem and be used by the broader public as well.

This guide will be a tool for all interested parties trying to identify benthic invertebrates in West Greenland. The animals depicted are mainly the commonly caught macrobenthic taxa but rarer species are also included. Some groups are represented as morphospecies to ease identification. While other groups are only superficially mentioned e.g. "wormlike animals" includes penis worms, peanut worms and spoon worms. Other groups like sponges are split up into morphospecies to make the guide easier to use. For identification on a lower taxonomic level, guides for corals and sponges are available from the North Atlantic (NAFO) area (Best *et al.*, 2010; Kenchington *et al.*, 2009) and for hydroids in Greenland (Schuchert, 2001). The first few pages of the guide are dedicated to basic instructions in how to collect and photograph specimens. At the moment only a Danish version is available and it is of highest priority to translate it to Greenlandic. This guide is the first of its kind in the region and provides an important tool in our understanding of the distribution and abundance of marine benthic species in West Greenland. Subsequent editions will be developed as new information is gathered.

References

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